DOCUMENT RESUME

ED 148 241 HE 009 502

AUTHOR Jackson, Gregory A.
TITLE Financial Aid and Student Enrollment: Appendix E. The Development of Institutions of Higher Education: Theory and Assessment of Impact of Four Possible Areas of Federal Intervention.
INSTITUTION Harvard Univ., Cambridge, Mass. Graduate School of Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Office of Planning, Budgeting, and Evaluation.
PUB DATE [77]
CONTRACT 300-75-0221
NOTE 43p.; For related documents see HE 009 500-505; Not available in hard copy due to marginal legibility of original document
AVAILABLE FROM USOE-OPBE, Room 4087, 400 Maryland Avenue, S.W., Washington, D.C. 20202, or Harvard Graduate School of Education, c/o George B. Weathersby, 450 Gutman Library, Harvard University, Cambridge, Massachusetts 02138

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Access to Education; *College Choice; College Planning; Educational Demand; *Enrollment Influences; *Federal Aid; Federal Legislation; Financial Support; *Government School Relationship; Higher Education; Predictor Variables; Statistical Data; *Student Financial Aid; Tables (Data)
IDENTIFIERS *Higher Education Act Title III; Institutional Characteristics

ABSTRACT

The results of an analysis of demand for higher education among the high school class of 1972 are summarized in this report. Addressed is the question "What impact might the expansion of federal financial aid programs around 1970 have had upon enrollment at all colleges (or at Title III colleges)?" The basic results of the demand analysis are that (1) socioeconomic background, academic achievement, and aspiration are the major determinants of high school graduates' postsecondary choices; (2) college characteristics appear to have little effect on these decisions once individuals have made their applications; (3) financial aid has an effect on individuals' decisions; and (4) it is the offer of aid rather than the amount of aid that is most important. From this and ancillary data the study concludes that expanded financial aid programs may have increased the likelihood individuals would attend college by between 0.3 and 2 percentage points. However, this effect was counteracted by other factors, as evidenced by the decrease in the overall enrollment rate among high school graduates in the period between 1968 and 1972. It is concluded that financial aid probably had minimal impact on enrollment at Title III colleges over this period, after controlling for the increased pool of potential students. (Author/LBH)

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Financial Aid and Student Enrollment

Gregory A. Jackson

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Appendix E

The Development of Institutions of Higher Education:
Theory and Assessment of Impact of Four Possible Areas
of Federal Intervention

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This study of the development of colleges and universities was undertaken for the United States Office of Education, Office of Planning, Budgeting and Evaluation under contract number 300-75-0221. The project was conducted by a research team from the Harvard Graduate School of Education under the direction of George B. Weathersby. The purposes of the study were to use a merged machine-readable data base and relevant historical documents, to identify the institutional effects of funds from Title III of the Higher Education Act of 1965. Reports prepared under this contract are listed below and copies may be obtained from the USOE-OPBE (Room 4087, 400 Maryland Avenue, S.W., Washington, D.C. 20202) or the Harvard Graduate School of Education (c/o George B. Weathersby, #450 Gutman Library, Harvard University, Cambridge, Massachusetts 02138). Please include a check for the indicated amounts for orders from Harvard.

The research team consisted of Frederic Jacobs, Gregory A. Jackson, Edward P. St. John, Tyler Tingley, and George B. Weathersby. Research assistance was provided by Joan Gallos and William Trueheart. Also, we extend special thanks to our consultants, Daryl E. Carlson, James Farmer, and Wayne Kirschling, and to our secretary, Mary Sanderson.

Final Report

"The Development of Institutions of Higher Education: Theory and Assessment of Impact of Four Possible Areas of Federal Intervention" (62 pages, $2.50)

Appendices

A. Legislative History of Title III

"The Evolution of Eligibility Criteria for Title III of the Higher Education Act of 1965" by Frederic Jacobs and Tyler Tingley (61 pages, $2.50)

B. Theories and Measures of Institutional Development and Review of Previous Studies

"Institutional Development In Higher Education: A Conceptual Framework For Evaluation" by Edward P. St. John and George B. Weathersby (51 pages, $2.25)

C. Descriptive Analysis of Institutional Change

"Descriptive Analysis of Institutional Change Using HEGIS, CFAF, and Title III Data Bases" by Edward P. St. John, Tyler Tingley, and Joan Gallos (94 pages, $3.50)

D. Review of Cost and Efficiency Research

"A Review of Production Function Estimation for Higher Education Institutions" by Daryl E. Carlson (122 pages, $4.25)

E. Financial Aid and Student Enrollment

"Financial Aid and Student Enrollment" by Gregory A. Jackson (30 pages, $1.50)

F. Description of Merged Data Base

"Description of Merged Data Base" by Gregory A. Jackson (3 pages, $ .50)

G. Production Function Analysis

"Production Function Analysis in Higher Education: General Methodology and Application to Four Year Black Colleges" by William Trueheart (50 pages, $2.25)

Financial Aid and Student Enrollment

ABSTRACT

This report summarizes the results of an analysis of demand for higher education among the high school class of 1972. It then addresses the question "What impact might the expansion of federal financial aid programs around 1970 have had upon enrollment at all colleges (or at Title III colleges)?". The basic results of the demand analysis are that (a) socioeconomic background, academic achievement, and aspiration are the major determinants of high school graduates' postsecondary choices, (b) college characteristics appear to have little effect on these decisions once individuals have made their applications, (c) financial aid has an effect on individuals' decisions, and (d) it is the offer of aid rather than the amount of aid that is most important. From this and ancillary information the study concludes that expanded financial aid programs may have increased the likelihood individuals would attend college by somewhere between 0.3 and 2 percentage points, depending on the assumptions made. However, this effect was certainly counteracted by other factors as evidenced by the decrease in the overall enrollment rate among high school graduates in the period between 1968 and 1972. Thus, financial aid has probably had minimal impact on enrollment at Title III colleges over this period, after controlling for the increased pool of potential students.

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FINANCIAL AID AND STUDENT ENROLLMENT

Colleges felt a variety of influences during the early nineteen-seventies: the stabilizing of the traditional applicant pool, the end of the draft as a factor in the enrollment decision, rapidly increasing expenses, and a changing federal role in postsecondary education. Under—or despite—these pressures, total enrollment in higher education grew by 9.8 percent from 7.5 million in the fall of 1969 to 8.2 million in 1973. The average institution's size increased 0.5 percent, from 3,060 to 3,076.[1]

Over this same period, total expenditures by the federal Office of Education under the Higher Education Act rose 78 percent, from 531 million (FY 1970) to 946 million dollars.[2] In 1969-70 5.2 percent of this total went to Title III, Strengthening Developing Institutions; in 1972-73 4.2 percent did. Most of the remainder went to three student-aid programs: Educational Opportunity Grants (143 to 183 million), College Work-Study (172 to 361 million), and Federally Insured Loans (98 to 206 million). Three other programs also provided students significant support: National Direct Student Loans (195 to 287 million), Veterans' Education (245 to 658 million), and Social Security. Including all other programs, such as graduate fellowships and facilities grants, the federal government spent 3.9 billion dollars on higher education in 1969-70 and 6 billion in 1972-73.[3] This is 1.5 million dollars per institution or $521 per enrolled student in 1969-70, 2.2 million dollars per institution or $730 per student in 1972-73.

The Title III program gave 469 institutions an average of $59,000 in 1969-70 and 467 an average of $85,807 in 1972-73. If the program has observable impacts, they are not likely to overshadow those of other federal support programs; consequently it is important to get some idea what these other programs' impacts are. This substudy considers generically the largest of these, student-directed financial aid. Unfortunately, clear analysis proved possible only for a somewhat more extensive yet less clearly defined program. Our data, which we will describe

further on, asked students what aid colleges had offered them before they decided to enroll. Not until the end of their first year were students asked specifically where this aid had come from; thus we could not differentiate federal from state or institutional aid programs at decision time. This is immaterial, in one sense: students' response to to aid is unlikely to depend on its source as much as on its timing, form, or amount. But it is material in another sense: some federal programs may not be explicitly included in colleges' aid offers, so we may have underestimated the aid available to students. Two points merit comment. First, we did not try to estimate total aid offered. Second, students are unlikely influenced much by aid not offered them; if they are, then such effects probably are uniform. Therefore, our results, although not based specifically on federal aid programs, should be relevant to those programs' effects.

Traditionally student aid has rewarded student accomplishment or offset financial disadvantage. More rarely it has been intended to direct students' decisions: the most notable example is the athletic scholarship. Whatever its purpose, however, large-scale student aid presumably will induce some students to attend who might not have done so otherwise; even more likely it will encourage students to attend one or another particularly generous college. However, we needed to know just how large these effects are. To this end we undertook three closely related analyses. The first, from a sociological perspective, examined the relationship between students' background, academic achievement, and aspirations and their decisions to apply to or attend college. Socioeconomic status, academic achievement, and aspiration or plans proved to have the most influence. The second analysis focused on the attendance decisions of students who applied to college, and particularly on how college characteristics affected them. Background, achievement, and aspiration or plans continued to influence students at this stage, but even after controlling these differences students awarded financial aid by the colleges they applied to were 8.5 percentage points more likely to attend than otherwise identical but unaided students. Our focus on

applicants came from our interest in the effect of specific financial-aid awards; students who do not apply do not receive these. In effect, we viewed preselection (where to apply) as determined by measured and unmeasured background characteristics, and did not analyze in any detail the decisions of students to apply to particular institutions. Some descriptive analysis provided some useful findings, however: despite the conventional wisdon and some before-the-fact statements to the contrary, students apply to relatively few colleges and these are remarkably homogeneous. In light of this finding it is not surprising to find college characteristics (other than financial aid, which students presumably cannot preselect) have little effect on student decisions whether to attend once students have decided where they will apply. This carries over to a large extent in the decision where to attend, but here a college's level has a strong influence (two-year colleges are very popular, once quality measures are controlled) and financial aid has an even stronger influence than it does on whether students attend.

The purpose of this study was quite specific: we were to estimate how federal student-aid programs might have affected Title III colleges, in particular their enrollment. The ideal analysis to this end would estimate how all or particular subsets of high-school graduates respond to financial aid offers by Title III institutions given a variety of concurrent actions by non-Title III institutions or other agencies. The data to do this simply are not available. Therefore, we conducted a broader analysis, and will use its results and some assumptions to obtain the desired result. Our data provided a wealth of information for all high-school graduates in 1972, but college-application information only for applicants. This limitation is endemic to demand research. To obtain results for all high-school graduates' reactions to college actions one must either (a) assume something about applicants and non-applicants' perceptions of the colleges they consider, as many other studies have done; (b) ignore college characteristics altogether, as many sociological studies and parts of our own have done; or (c) make some assumptions when generalizing results for applicants to all students, as we have done. The issue, however technical the procedure, is the validity of the assumptions made; since we cannot be certain a particular assumption is correct we have tried to bracket rather than pinpoint the "best" estimate.

In fact we undertook three analyses. First, we investigated the effects of background, achievement, and attitudinal variables on the decisions of all high-school students, intentionally omitting any college variables except some aggregate characteristics of the options locally available. This analysis implied, as our reading of the sociological literature suggested it would, that a student's socio-economic background, academic achievement and/or ability, and aspiration are the important determinants of his or her postsecondary choice. Knowing such information it is possible to correctly predict 85 percent of our sample's decisions whether to attend; thus college characteristics or actions change few students' minds.

The second analysis examined the decisions of students who applied to college—both where to apply and whether to attend. We found students tended to apply to only one college or to two or three reasonably similar ones; the former finding, which surprised us, finds extensive support in Astin's surveys of college freshmen over the past few years, although it is probably slightly exaggerated by students' misrecollections. In light of this, it did not surprise us to discover that the characteristics of colleges applied to had little impact on students' decisions; clearly the major impact of college characteristics is in the preselection phase. This has implications for the purveyance of information to prospective students: for example, financial aid information might have a larger effect if students were aware of it early on. Colleges' actions in awarding financial aid, which we found to be somewaht predictable from socio-economic, academic, and cost variables, had much stronger effects: applicants awarded aid were about 8.5 percentage points more likely to actually enter college than otherwise similar but unaided students. At least over the range of awards represented in our sample, the award of some aid was the important act; the actual amount awarded, which in any case varied mostly with the institution's cost, had little marginal effect.

Our last analysis examined the choices of students who were admitted to or at least two colleges. These applicants, almost 90 percent of whom entered some college, responded more strongly to financial-aid awards,

but this effect was mitigated by colleges' tendency to award aid to the same students.

Estimating from these results how enrollment might have responded to broad-based aid programs requires assumptions about the behavior of non-applicants and some estimate of how many students the programs aided who would not have been aided otherwise. The latter is extraordinarily difficult to find; data on unduplicated numbers of federal-aid recipients by whether they receive other aid have eluded us. Therefore, we examined Astin's annual surveys of freshmen, which include questions about "major" sources of support.[4] These data imply the percentage of freshmen receiving aid rose 4 to 9 points between 1969 and 1972; the percentage newly aided by federal money probably lies between these extremes.

It seems to us non-applicants' behavior is similarly circumscribable. At one extreme, non-applicants may be utterly indifferent to aid programs, and therefore a new aid program would induce none of them to apply or attend. At the other extreme, non-applicants may be as sensitive to aid programs as the most sensitive applicants: as we shall show, those from poor socioeconomic backgrounds, those from North Central states, or those with poor grades. Non-applicants' true responsiveness probably lies somewhere between these extremes; perhaps they are as sensitive as the average applicant.

Table 1 gives our estimates of the increase in the proportion of high-school graduates entering college attributable to extensions of federal student-aid programs between 1969 and 1972. The figures are percentage points on the enrollment rate. The rows reflect different estimates what proportion of prospective students were offered aid by these programs over these years who would not have received aid otherwise. The columns reflect different assumptions about the aid-responsiveness of non-applicants: that they are unresponsive, that they respond like the average student, that they respond somewhat more than this, or that they respond like the most responsive applicants. The first panel of the table assumes our estimate of applicant responsiveness is correct, while the second assumes the true estimate is the extreme estimate. The last is useful to assess the response of poor or under-achieving subpopulations, although

Table 1

Estimated Enrollment Rate Increases from 1969 to 1972
Due to Increased Financial Aid under Different Assumptions,
in Percentage Points

Average Response Among Applicants (8.5)

Response Among Non-Applicants:

Increase in percent aided (percentage points)	None (0)	Average (8.5)	High (11.4)	Extreme (15.7)
4	0.3	0.5	0.5	0.6
7	0.6	0.9	0.9	1.1
9	0.8	1.1	1.2	1.4

Extreme Response Among Applicants (15.7)

Response Among Non-Applicants:

Increase in percent aided (points)	None (0)	Average (8.5)	High (11.4)	Extreme (15.7)
4	0.6	0.8	0.8	0.9
7	1.1	1.4	1.5	1.6
9	1.4	1.8	1.9	2.0

NOTES:

Assuming 30.3 percent of applicants are aided and that 55.6 percent of high school graduates apply to colleges. Estimates are substantially less sensitive to errors in these assumptions than they are to those included explicitly above. The increase in the attendance rate among all students is given by $Pa\Delta Ra+Pb\Delta Rb+Pc\Delta Rc$, where Pa, Pb, and Pc are the proportions applying and aided, applying but not aided, and not applying; and ΔRa, ΔRb, and ΔRc are the changes in the enrollment rates within these three groups. The change in the enrollment rate among aided applicants is zero, since none of them are newly aided. The change in the rate for non-aided applicants is the proportion of them newly aided (the row variable above) times the applicant response rate (8.5 in the first panel, 15.7 in the second). The change in the rate for non-applicants is the proportion of them newly aided (assumed to equal the proportion of applicants newly aided, since federal aid programs are in principle offered to all students) times the assumed response rate for non-applicants (0, 8.5, 11.4, or 15.7; the 11.4 figure is the response rate observed for Black and Mexican-American applicants).

our analysis was more broadly based than this.

The general conclusion from this table is that the enrollment rate among high-school graduates increased from 1969 to 1972 by about 1 percentage point (and by perhaps as much as 2 percentage points) under the influence of expanded federal student-aid programs. There certainly must have been countervailing forces, for the actual enrollment rate among high-school graduates decreased by 6.2 percentage points over this period, from 61.6 percent in 1969 to 55.4 percent in 1972.[5]

What is remarkable here is not this overall estimate but the fact that even under fairly extreme assumptions our analysis suggests federal student-aid programs had only a modest effect on enrollment in colleges and universities. (Recall that in 1972 the Basic Educational Opportunity Grants program was enacted and limited funding began in 1973-74.) If particular collegiate sectors or subpopulations evidence commensurate increases, then these may well be due to student aid (recall these findings are in terms of enrollment rates, not absolute enrollment). But large increases are probably due to other influences.

The Title III program for the most part addresses the prospects of Black colleges, and underlying this is some concern for the postsecondary behavior of Black students. Our results for college characteristics involve only institutions applied to; they do not estimate, for example, how the probability a student will apply to a given college varies with his or her perception of that college's characteristics. Thus we really cannot say much about Black colleges' attractiveness to Black or other students, short of commenting that if they give aid to applicants and other colleges do not, applicants are likely to select them.

Our data are somewhat more relevant to the behavior of Black students. We did some preliminary analysis on subsamples differentiated by race. These results, taken in conjunction with those by socioeconomic status we present later, suggest poor Black students behaved more like other poor students than like better-off Black students; consequently, we have reported results by SES but not by race. The aid responsiveness of Black and Mexican-American students was about 34 percent higher than that of the average student (11.4 percentage points rather than 8.5) but still substantially lower than the extreme estimate we used above.

In any case we find no evidence that Black students' behavior given Black colleges' actions differs substantially from other similar students' behavior given other similar colleges' actions.

The remainder of this report summarizes briefly the analyses which underlie these estimates. The complete analysis is described in our technical report, Financial Aid to Students and the Demand for Post-secondary Education, available from Gregory A. Jackson, 452 Gutman Library, Harvard Graduate School of Education, Cambridge, Massachusetts 02138.

METHODS AND DATA

Most other research on student aid has been implicit (inferring aid effects from price effects) or post hoc (asking aided students what they would have done if not aided). The conclusions from the former, despite extraordinary methodological diversity, are relatively consistent. Students are 0.2 to 1.4 percentages points less likely to attend schools $100 more expensive.[6] The conclusions from the latter are highly variable and therefore defy summary: the only general conclusion is that students perceive aid as an incentive to attend. Only three of the economic studies we analyzed (Campbell and Siegel, Bishop, and Corrazzini et al.) used national samples; only one of these (Bishop) used individual data. Four studies (Radner and Miller, Hoenack et al., Spies, and Kohn et al.) used geographically restricted individual data.[7] None had adequate information on the colleges students applied to or on financial aid awards.

Since our focus was national financial-aid policies' impact on individual students, we sought national, individual data including college and financial-aid information. No one source proved adequate, but we assembled from four major surveys appropriate data describing a stratified sample from the high-school class of 1972. The basic survey was the National Longitudinal Study carried out by the Educational Testing Service and the Research Triangle Institute under contract to the National Center for Educational Statistics. We added home-town data from the Fifth Count of the 1970 U.S. Census and college data from the Higher Education General Information Survey and the American Council on Education. We are indebted for the latter to Alexander Astin and his colleagues.

The analyses we report here assume that background, academic, aspiration, and college characteristics contribute linearly and additively to the probability a student will attend a college. This does not reflect a belief that human decision making is so organized. Rather, it comes from a long history of sociological and economic research on human decisions. This work suggests generalities in such behavior useful for public-policy considerations are appropriately described thus. Nevertheless, we undertook several subanalyses to see whether nonlinear or interactive specifications helped the analysis; they did not.

VARIABLES

We give detailed information on the origin and construction of our variables in the technical report. We will merely list and define them here.

Census White Collar (CENWC) describes the occupational distribution and Census Tight Labor Market (CENTLM) the pattern of labor-force participation and unemployment near the student's high school. Their metric is arbitrary. Number of Institutions (NINST), Percent Public (PPUBLIC), and Average Four-Year Cost (AV4CST) come from an aggregation of HEGIS information for these same local areas. Average Four-Year Cost refers only to tuition and required fees. Region (NEAST, NCENT, WEST, SOUTH) refers to the Census four-region classification.

Parents' Income (PINCOME) comes from the base-year questionnaire. The students selected one of ten categories; we assigned the corresponding midpoint in hundreds of dollars. Socioeconomic Status (SESC, HISES) is an RTI-supplied composite based on parents' education, father's occupation, parents' income, and a checklist of items in the house. Race (BLACK) and Religion (NOREL) come from the base-year questionnaire.

The school variables give the percentage of the school's enrollment from farm families (SPFRM), in a college-preparatory or general curriculum (SPCP, SPGEN), or minority (SPMIN); the percentage of its faculty holding advanced degrees (SPFACDG); and its offering of agriculture or foreign language courses (SAGR, SFLANG).

The students' Test Score (TEST) is the average of four subtests of an instrument specially developed by the Educational Testing Service. This test correlates 0.844 with the composite American College Test and 0.846 with the composite Scholastic Aptitude Test. Imputed Average (IMPAVG) is ETS's summary of the percentile, rank, and course-grade information on a questionnaire sent to the school. Academic Track (ACAD) is based on this same questionnaire.

Parents' Educational Aspiration (PEDASP) is the number of years beyond high school a student's parents wished him or her to have, as reported on the base-year questionnaire.

Friends' Plans (FRCOL) is the student's base-year response to "What do most of your close friends plan to do next year?" Occupation (OCCPLND, OHOME, OMIL) is his or her own choice from a list of occupational groups, recoded to approximate Duncan scores using a separate data set. Educational Aspirations (EDASP) is how many years of education beyond high school the student would like to obtain. Postsecondary Plans (PLACAD, PLVTCH, PLHOME) is the student's choice from a list of possible responses to "If there were no obstacles, what would you most like to be doing during the year after you leave high school?"

The college variables are somewhat more self-explanatory. The Control variables (CPRIV, CREL, CPUB) come from the HEGIS survey, as do the Highest Offering variables (CLTBA, CBA, CIMLTD, CDOC). Enrollment and Expenditure (CENRL, CEGEXP) also come from this source. The Social Prestige (CPRSTG) variable comes from some work on status attainment by Richard Coleman, a sociologist at the Joint Center for Urban Studies of MIT and Harvard. The Academic Quality (CACT) variable comes from Alexander Astin's work. Per-Student Expenditure (CPST, CPSTEXP), Distance (CDIST), Same State (CSMST), and Same Place (CSMPL) come from HEGIS and Zip-Code information. Total Cost (TCOST) is in-state or out-of-state tuition as appropriate plus room and board for colleges not in the same place as the student's high school. The financial-aid variables are the dollar amount of aid a student was awarded by a given college (TOTAID) and a dummy variable indicating whether the student received aid (AID). Averages of these variables across a student's choices are denoted by the suffix -M.

Table 2 provides basic statistics for these variables. The samples exclude students lacking data on any of several key variables. Table 3 shows that 2 111 students applied to no postsecondary institutions and an additional 186 to no colleges. ("College" refers to institutions listed in the Education Directory: Higher Education for 1972, "other postsecondary institution" to schools with FICE codes but not listed therein. The technical report provides further detail.) The other 2,882 students filed 4,312 college applications; 2,311 of them attended college.

Table 3 merits a bit more consideration. We--and we suspect most readers--had assumed that students applying to college chose an ideal college, a desirable yet practical alternative, and (perhaps implicitly) a "safety." Other research on student choice, lacking specific college data, has assumed this and imputed correspondingly large and varied choice sets to students. Yet Table 3 shows 1875/2882 = 65.1 percent of applicants applied to only one college. These counts are based on questions asked in October of 1973, some eighteen months after the fact. During this period it is reasonable to expect students to forget some applications; it is unlikely they will invent any. Thus it is not surprising to find that questions asked these students in May 1972 and a different sample from the same class in fall 1972 suggest that a few more students applied to a few more schools than these statistics suggest. But the overall conclusion nevertheless stands: a great many students, about half the applicants, apply to only one college. Table 4 provides more detailed information on applications. This further refutes the conventional view: three-application students' third choices are much like their first choices, and unlike two-application students' choices. Moreover, students admitted to their first choices do not necessarily attend them--in fact only 27.5/89.9 = 30.6 percent of two-application and 44.3/80.0 = 54.8 percent of three-application students do so. Few applications (375/4,313 = 8.3 percent) are rejected at all; only 3.3 percent of the applicants are rejected by each college that they apply to.

These data suggest that students' preselection of colleges is an extremely important part of their eventual decision which (or whether) to attend. We make the distinction because the information available to

Table 2

Basic Background and Typical Application
Statistics for Different Analytic Subsamples

	means				standard deviations			
	1	2	3	4	1	2	3	4
CATT	.4596	.7712	.7229	.8484	.4984	.4202	.4477	.3589
CATT 1	.4527**	.8043	.7881	.8412	.4978	.3968	.4136	.3637
CEHMC	49.8736	51.0669	50.9064	51.3230	9.8528	10.1472	9.8779	10.5639
CENTLN	49.9512	49.9134	50.3351	49.2402	9.8629	9.5281	9.9753	8.7312
NEAST	12.6285	13.0475	11.8908	14.8937	11.9535	12.4557	10.6898	14.6646
PPUBLIC	49.1954	48.5117	51.1107	44.3631	25.7507	25.3309	25.0048	25.3105
AV4CST	13.8283	14.2099	13.6830	15.0509	7.2821	7.1366	7.2379	6.8932
MEAST	.2750	.3084	.2396	.4183	.4466	.4620	.4270	.4936
MCENT	.2918	.2509	.2849	.1967	.4546	.4336	.4515	.3977
SOUTH	.2745	.2563	.2639	.2389	.4463	.4356	.4409	.4267
WEST	.1587	.1864	.2116	.1461	.3654	.3895	.4086	.3535
PINCOME	128.0867	141.5778	131.8214	157.1511	76.8871	81.1720	76.6326	85.7083
PRICH	.1246	.1628	.1289	.2168	.3303	.3692	.3352	.4123
SESC	1.9925	2.1712	2.0812	2.3149	.7008	.6912	.6789	.6884
HISES	.2417	.3395	.2742	.4473	.4282	.4736	.4463	.4971
BLKK	.0991	.0882	.0907	.0842	.2988	.2836	.2873	.2778
MOREL	.0500	.0420	.0400	.0432	.2180	.2007	.1960	.2079
SFLANG	.9449	.9547	.9473	.9662	.2282	.2080	.2231	.1810
SAGE	.3384	.2928	.3262	.2394	.4732	.4551	.4690	.4270
STRDIND	.7841	.7573	.7793	.7220	.4115	.4288	.4148	.4483
SPHIH	13.2462	13.6152	14.2081	12.6739	22.0645	22.2562	22.5790	21.7144
SPFRM	9.1302	8.0042	8.9439	6.5042	15.4435	14.6039	15.1437	13.3730
SPCP	45.0963	48.7352	46.5912	52.1575	23.1313	24.1423	23.1914	25.2263
SPCOL	50.4036	53.8563	52.4429	56.1123	18.6505	19.0258	18.3136	19.9149
SPGEN	26.6327	25.7173	27.2749	23.2742	23.1359	23.3723	23.6789	22.6752
SPFACDG	41.4340	42.9380	41.0609	45.9225	20.9637	21.0407	21.2361	20.3860
TEST	51.3909	54.1471	52.9822	56.0066	8.0760	7.2077	7.1325	6.9357
ACAD	.4680	.6670	.5842	.7992	.4990	.4714	.4930	.4009
IMPAVG	5.8150	6.5541	6.2591	7.0250	2.8333	2.7646	2.7648	2.6997
PEDASP	3.1477	3.9338	3.6755	4.3322	1.8299	1.4433	1.4864	1.2800
FRCOL	.5891	.7803	.7328	.8562	.4921	.4141	.4427	.3511
OCCPLND	57.4172	64.3218	62.6551	66.8274	20.5652	17.8900	18.6439	16.3892
OHOME	.0229	.0080	.0088	.0066	.1495	.0890	.0936	.0812
OMIL	.0189	.0147	.0113	.0202	.1362	.1205	.1057	.1408
EDASP	3.7975	4.6539	4.3958	5.0379	2.0492	1.6235	1.7317	1.3608
PLACAD	.4717	.7417	.6715	.8589	.4993	.4167	.4699	.3483
PLVTCH	.1389	.1192	.1360	.0607	.3458	.3242	.3630	.2390
PLHOME	.0291	.0056	.0058	.0052	.1681	.0746	.0760	.0723

Table 2, continued

	means				standard deviations			
	1	2	3	4	1	2	3	4
ESTSAT	299.230*	298.4062	299.2736	297.0211	13.981	13.3128	13.5498	12.3121
ESTWAGE	279.690*	278.8975	278.0504	280.2504	38.519	33.9222	35.6837	30.8743
CPRIV		.1464	.1072	.2090		.3189	.3095	.3238
CDOC		.2635	.1849	.3941		.3908	.3884	.3591
CEMRL		7.7218	7.1856	8.5779		7.1939	7.6007	6.4039
CPRSTG		3.5096	2.8736	4.5247		2.4194	2.2001	2.4085
CACT		21.1599	20.4974	22.2174		2.9859	2.8538	2.8844
CPSTEXP		20.3067	18.4137	23.0416		14.6403	13.6233	15.6040
TCOST		15.0377	13.8273	16.9697		9.9916	10.2023	9.3318
AID		.2352	.2671	.1845		.3886	.4359	.2914
TOTAID		1.0562	.7291	1.5784		2.6467	1.7941	3.5318
NCOST		13.2675	11.9273	15.4067		9.7989	9.9910	9.0891
CDIST		3.2811	3.0313	3.6798		5.0104	5.2441	4.5877
CRMST		.7116	.7489	.6506		.4156	.4333	.3781
n	4375	2133	1312	821				

Key:

1. 4,375 students with adequate background data.
2. 2,133 students in column 2 with adequate college-application data.
3. 1,312 students in column 3 filing one application.
4. 821 students in column 4 filing two or more applications.

Notes:

*based on whole (n = 5,179) sample

**estimate

Table 3

Number and Percentage of NLS Students Filing Any or College Applications

Pre-Graduation Applications

Any Institution	Number 0	1	2	3	Total*	Percent 0	1	2	3	Total*
College 0	2706	227	22	6	2961	52.3	4.4	0.4	0.1	57.2
1		1211	93	12	1316		23.2	1.8	0.2	25.4
2			483	59	542			9.3	1.1	10.5
3				360	360				7.0	7.0
Total*	2706	1438	598	437	>179	52.3	27.8	11.5	8.4	100.0

Pre-Graduation Applications plus Attendance

Any Institution	Number 0	1	2	3	4	Total*	Percent 0	1	2	3	4	Total*
College 0	1897	367	28	5		2297	36.6	7.1	0.5	0.1		44.3
1		1744	122	8	1	1875		33.7	2.3	0.2	0.0	36.2
2			517	75	1	593			10.0	1.4	0.0	11.4
3				333	11	344				6.4	0.2	6.6
4					71	71					1.3	1.4
Total*	1897	2111	667	421	83	5179	36.6	40.8	12.9	8.2	1.6	100.00

*Totals may not add exactly because of rounding or weighting

Summary

	Noncollegiate None	Some		Noncollegiate None	Some	
Colleges						
None	1897	400	2297	36.6	7.7	44.3
Some	2665	217	2882	51.5	4.2	55.7
	4562	617	5179	88.1	11.9	100.0

Table 4

Selected Characteristics of Applications, by Acceptance, Preference, and Choice

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	accepted		all	rejected	chosen		single app.	two applications			three applications				summer applications			
	m	sd	m	m	m	sd		all	#1	#2	all	#1	#2	#3	only	after #1	after #2	all #3
Private	.1469	.3540	.1607	.3178	.1276	.3338	.0981	.1593	.1598	.1587	.2465	.2635	.2678	.2083	.0798	.1185	.2185	.1
Public	.7245	.4468	.7141	.5949	.7387	.4394	.7968	.6961	.6779	.7143	.6010	.5670	.5937	.6423	.8025	.7324	.6601	.6
Less than BA	.2970	.4570	.2770	.0560	.3521	.4777	.3988	.1914	.1648	.2180	.0951	.0655	.0866	.1333	.4774	.6019	.3796	.2
Doctorate	.3258	.4687	.3395	.4912	.2840	.4511	.2827	.3855	.4086	.3654	.4465	.4553	.4158	.4685	.1799	.1558	.1912	.3
Enrollment	7.8387	7.9073	8.0063	9.8958	7.3597	7.5259	7.2606	8.3689	8.3239	8.4138	8.6959	8.7346	8.4521	8.9009	7.3820	6.0437	8.0634	7.1
ACT	21.2714	3.1950	21.4753	23.7500	21.0006	3.0825	20.5960	21.5467	21.7114	21.3819	22.8830	23.2660	22.9816	22.4013	20.2708	19.9083	20.8417	21.
Prestige	3.5767	2.4986	3.7824	6.0957	3.2779	2.4392	2.9358	3.9282	4.0557	3.8026	4.9799	5.2204	5.0298	4.6895	2.6374	2.5465	3.2485	4.1
Total Cost	14.1056	11.8872	14.639	20.5525	13.2865	11.5066	12.1161	14.9071	15.4687	14.3454	18.5252	19.0390	18.5551	17.9816	11.2186	10.5882	11.8651	19.
Tuition&Fees	8.3593	7.9651	8.6607	12.0011	7.8909	7.6379	7.1322	8.5410	8.8533	8.2287	11.2369	11.2845	11.4137	11.0135	6.6558	6.5961	7.6248	13.
Distance	3.6450	6.076	3.6497	3.7017	3.4569	5.7215	3.6791	3.8215	3.7951	3.8479	3.5720	3.8370	3.4761	3.2679	3.4172	3.7278	3.3164	6.
Same Place	.1022	.3030	.1986	.0590	.1058	.3077	.1118	.0932	.0897	.0966	.0907	.0614	.1039	.1068	.0986	.1244	.1798	.
Total Aid	2.1907	5.9399	--	--	2.6800	6.2121	1.8827	2.2051	2.6283	1.7819	2.3438	3.7354	1.9932	1.7027	2.1685	1.6754	4.1555	6.
Some Aid	.2315	.4219	--	--	.2805	.4439	.2381	.2145	.2222	.2067	.1992	.2854	.1776	.1346	.2579	.2896	.4504	.
Net Cost	12.4413	11.1923	--	--	11.2457	10.8099	10.7924	13.2283	13.4122	13.0443	16.6266	16.2310	16.8219	16.8269	9.3697	9.1105	9.4065	14.
n	3956		4313	357	2311		1316	1084	542	542	1080	360	360	360	665	99	46	
n rejected							56	124	69	55	177	69	53	55				
%							4.3	11.4	12.7	10.1	16.4	19.2	14.7	15.3				
n attended							803	--	237	149	--	159	74	52				
%							61.0	--	43.8	27.5	--	44.3	20.5	14.4				

students at the preselection stage is scanty; for example, neither up-to-date cost estimates nor any financial-aid information are likely to be available.[8] Public policies which affect institutions without affecting the institutional information students actually consider at this stage are thus unlikely to have much impact, at least on students' decisions.

It is important to note here that our analysis is not well-suited to direct assessment of the effects of college characteristics upon preselection and therefore upon attendance. Students presumably obtain some information about some subset of the colleges available to them; analysis of preselection requires data on this data-gathering operation and the perceptions which result from it. This problem does not afflict our analysis of student-aid effects, since the college act in question—the award of aid with an acceptance—is invisible to the student until decision time. Our inclusion of college characteristics in this substudy therefore serves less to estimate their effects than to keep estimates of financial-aid effects free of bias. The technical report in fact contains a number of preselection-directed analyses we do not report here; in general we find the same factors which influence the eventual attendance decision also influence the sort of college applied to.

In many ways, the selection of and decision to attend a college both fulfill students' plans. The data should therefore show that students' decisions to attend depend mostly on their background, academic ability, and aspiration and that college-application characteristics have little predictive bearing on whether a student attends. Our analyses show precisely this. Using the model estimated in the next section, one can correctly predict 85 percent of all high school graduates' decisions whether to attend given data on their socioeconomic background, academic performance, and aspiration. Among applicants, college characteristics have little influence on attendance once the same pre-application variables are controlled.

BACKGROUND, ABILITY, ASPIRATION, AND ATTENDANCE

Tables 5, 6, and 7 present stepwise least-squares estimates of a discriminant function classifying students according to their decisions whether to apply to college before high school graduation and whether to attend. This is the inductive part of our analysis: we can analyze the decisions of all high school graduates, but we can only infer what the effects of college characteristics and acts are. Moreover, we obtain some indication what the social forces which move students into college or other options are; these are remarkably consistent with results from the largely similar sociological research on this topic.

These multiple-discriminant equations give the probability a student with given characteristics will apply to or attend college. If, for example, the evaluation of the equation for a given student yields an estimate of 0.77, this means that among all students measurably identical to the student in question, some 77 percent will go to college (or apply to college, depending on the equation involved). The calculations underlying these figures are the same as those for a multiple-regression equation with a dichotomous (attend/not attend or apply/not apply) outcome and the same predictors; the standard model-strength indicators for this analogous regression are not directly relevant but nevertheless provide useful comparative information. We provide considerable detail on these issues in the technical report.

Few of the variables with significant impact on attendance are amenable to short-term public-policy influence. The zero-order correlation between Parents' Income and Attendance, 0.232, implies parents earning $1,000 more have children 1.5 percentage points more likely to attend college. A student from a family one standard deviation above the mean --that is, earning $20,240--is therefore about 11.6 percentage points more likely to attend than the average student. But these effects vanish when general socioeconomic attributes--primarily education and occupation--are controlled, suggesting the impact of an income subsidy program would be very much smaller. Somehow getting high schools to improve their students' performance shows more promise, but there is little knowledge how to do this.[9]

Table 5

Regression of Application on Individual Variables

VARIABLE	STEP PLACE	BACKGROUND	SCHOOL	STUDENT	FRIENDS	OCCUPATION	ASPIRATION	PLANS	r	standardized coefficient
CENNC	.00298	+							.046	
CENTLN	-.00194				-		-		-.040	
NINST									-.009	
PPUBLIC									-.017	
AV4CST	-	-	-	-	-	-	-	-	.004	
NEAST	.07375	.06516	.08764	.07604	.07594	.07615	.08426	.08079	.054	.073
NCENT			+	+	+	+	.04807	.04385	-.007	.042
SOUTH									-.027	
WEST		-							-.025	
PINCOME									.131	
PRICH									.104	
SESC		.11890	.11568	+	+				.197	
HISES		+	+						.183	
BLNK		.10256	+	+	+	+	+		-.000	
NOREL		-	-	-	-	-	-		-.063	
SFLANG			+	+			+		.043	
SAGR			-	-	-	-	-	-	-.061	
STRDIND			.05853	-	-	-	-	-	-.064	
SPMIN			.00159	.00106	+	+	+	+	.005	
SPFRM			.00197	.00176	.00175	.00182	.00194	.00174	-.006	.054
SPCP			.00196	+	+	+	+	+	.107	
SPCOL									.102	
SPGEN			.00133	+	+	+	+		-.017	
SPFACDG				-	-	-	-	-	.030	
TEST				.00462	.00368	.00319	+	+	.302	
ACAD				.11691	.09639	.07934	.06094	+	.318	
IMPAVG				.02083	.01940	.01710	.01651	.01261	.265	.072
PEDASP				.05512	.05009	.04210	.02431	.02088	.351	.077
PRCOL					.11244	.10076	.08378	.04853	.296	.048
OCCPLND						.00280	.00227	.00154	.304	.064
OHOME						-.13128	-		-.068	
OMIL									-.025	
EDASP							.03504	.02159	.381	.089
PLACAD								.24391	.415	.246
PLVTCH								.23269	.010	.163
PLHOME								-	-.122	
CONSTANT	.52760	.25631	.18706	-.11034	-.05779	-.013483	-.12349	-.06784		
R^2	.00714	.04779	.06003	.18422	.19313	.20400	.21314	.24828		

Table 6

Regression of Attendance on Individual Variables

VARIABLE	STEP PLACE	BACKGROUND	SCHOOL	STUDENT	FRIENDS	OCCUPATION	ASPIRATION	PLANS	r	standardardized coefficients
CENMC	.00625	.00332	+	+	+	+	+	+	.118	
CENTLM									-.017	
MINST									.009	
PPUBLIC				+	+	+	+		-.012	
AV4CST									.017	
NEAST	.03837	+	+						.042	
NCENT							+	+	-.049	
SOUTH									-.030	
WEST				+	+	+	.05103	.05354	.046	.039
FINCOME									.232	
PRICH									.169	
SESC		.17487	.15550	+	+	+	+		.336	
MISES		.11077	.11870	.08160	.07433	.07127	.07118	.05308	.218	.047
BLACK		+							-.067	
MOREL		-.11260	-.09917	-.09103	-.08305	-.07898	-.08179	-	-.075	
SFLANG									.061	
SAGR									-.105	
STRDIND			-.04257						-.055	
SPKEN			.00163	+	+			+	-.040	
SPFRN									-.114	
SPCP			.00209	+	+		+		.194	
SPCOL			.00249	.00188	.00129	.00120	.00106	.00110	.217	.041
SPGEN			+					+	-.060	
SPFACDG									.101	
TEST				.00504	.00357	.00305	+	+	.417	
ACAD				.20888	.17460	.15154	.12382	.05363	.473	.054
IMPAVG				.02403	.02125	.01771	.01673	.00950	.345	.054
PEDASP				.07398	.06567	.05402	.02702	+	.317	
FRCOL					.18885	.17345	.14833	.09006	.436	.089
OCCPLND						.00386	.00306	.00163	.432	.067
OHOME						-.20734	-.14609	-.08650	-.097	-.026
OMIL						-.12993	-.12794		-.038	
EDASP							.05290	.02263	.360	.093
PLACAD								.47042	.681	.471
PLVTCH								.14474	-.146	.100
PLHOME									-.147	
CONSTANT	.13176	-.08838	-.17831	-.55668	-.47857	-.58285	-.36199	-.35479		
R^2	.01366	.12804	.14824	.38010	.40516	.42780	.44872	.53422		

Table 7

Correlation and Regression Coefficients for Composite Influence Measures, Application, and Attendance

	PLACE	BACKGROUND	SCHOOL	STUDENT	FRIENDS	OCCUPATION	ASPIRATION	PLANS
Place	1							
Background	.14678	1						
School	.32348	.28762	1					
Student	.12509	.37983	.25761	1				
Friends	.10200	.29404	.26884	.48306	1			
Occupation	.05762	.23356	.16937	.49448	.32055	1		
Aspiration	.08251	.30988	.22033	.68617	.43872	.48771	1	
Plans	.10838	.34052	.23940	.66138	.47553	.51770	.65129	1
Application	.08529	.21147	.15093	.41032	.29565	.31751	.38062	.44832
Attendance	.12300	.34415	.25747	.58940	.43550	.45214	.55986	.69014
Dependence on ordinally prior variables:								
Multiple R		.14678	.40445	.41098	.51362	.50539	.71575	.74535
R^2		.02154	.16358	.16890	.26381	.25542	.51230	.55552
Stepwise Regression of Application:								
Place	.04387	.02846	+	+	+	+	+	+
Background		.10054	.08973	.02762	.02185	.01934	.01731	+
School			.04396	+				
Student				.18745	.16369	.13447	.09957	.06456
Friends					.05784	.05123	.04372	.02741
Occupation						.06802	.05606	.03429
Aspiration							.06623	.03040
Plans								.12332
Constant	.57352	.57109	.57106	.56996	.57010	.57064	.57090	.56992
R^2	.00695	.04710	.05343	.17245	.18223	.19611	.20458	.23200
Stepwise Regression of Attendance:								
Place	.06362	.03832	+			+	+	+
Background		.16606	.14593	.05994	.05016	.04676	.04356	.03130
School			.08173	.04210	.02571	.02606	.02399	.02028
Student				.25951	.21922	.17969	.12469	.06254
Friends					.09810	.08916	.07733	.04837
Occupation						.09205	.07319	.03455
Aspiration							.10435	.04076
Plans								.21889
Constant	.45984	.45584	.45579	.45426	.45450	.45522	.45564	.45390
R^2	.01480	.12324	.14362	.37061	.39890	.42421	.44539	.53110

The equations in Table 7 summarize this information at the expense of direct interpretability. Here we have created a composite measure for each sort of background, academic, or aspiration influence and standardized them to the same mean (0) and standard deviation (1). The composites' coefficients thus provide a directly comparable measure of their marginal influence on attendance decisions. Moreover, the reduction in each composite's coefficient as later influences are included in the equation provides a measure how direct the variable's effects are. According to this criterion about a fifth of Background's effects are direct, a quarter of School's and Student's, half of Friends', a third of Occupation's, and two-fifths of Aspiration's. Student (test scores, grades, and so forth) and students' Plans (". . .if there were no obstacles") have the largest influences.

The last equation for Attendance in Table 7 enables us to estimate the probability each student will attend and classify him or her accordingly. These predictions whether the student will attend some college are correct for 84.5 percent of the students. This suggests college characteristics and actions have little net effect on students' decisions. Two explanations might account for this result: students' background, achievement, and aspiration might in fact be the only important influences or, more likely, these variables might strongly influence the choice of colleges and these choices might in turn influence decisions. In either case a policy directed predominantly at colleges' characteristics and/or actions is unlikely to have a large impact on students' decisions, a point to which we will return.

COLLEGE APPLICATIONS AND ATTENDANCE

We have already shown that most students apply to one college and that those who apply to more apply to remarkably similar schools. For this analysis we therefore characterized each student's college choices by the average of the characteristics of the different schools he or she applied to. Moreover, by choice and necessity we focused on the 2,133 students who applied to college and provided sufficient data. Table 2 compares basic statistics for this sample to the 4,375 students analyzed above, while Table 8 compares the composite regression. The

applicants tend to come from somewhat more white-collar places in the Northeast or West; have families earning $1,300 more and of higher socioeconomic status; attend schools sending more graduates to college; earn higher grades and test scores and have parents with higher hopes for them; and aspire to college. The marginal effects of different variables on the probability applicants will attend are with few exceptions what they were for all students, but since the most extreme non-attenders are omitted from the sample, the overall classification (which varies positively with R^2) is less successful. Background characteristics explain up to 35 percent of the variation in application characteristics; application characteristics in turn explain 5 to 6 percent of the variance in attendance. (The detailed tables underlying these statistics appear in the technical report.)

Table 9 presents a discriminant equation differentiating attenders from non-attenders among applicants. The R^2 for background, academic, and aspiration variables along is 0.224, versus 0.531 in the corresponding equation of Table 7. Adding college characteristics raises this to 0.227, illustrating college characteristics' small marginal effect. Including financial aid increases R^2 more substantially, to 0.230, but more important the coefficient of AIDM, indicating the award of aid per se, is significant and substantial: applicants awarded aid are 8.5 percentage points more likely to attend than those not awarded aid, all other measured influences equal.

Tables 11 reestimate these equations for applicants raised in different socioeconomic backgrounds, from different regions, or earning different grades. (Tables 10 provide means for these subsamples.) There are some variations, but in general the equations are similar. In particular, each equation displays a substantial aid effect.

Table 9 is the most directly useful of the results from this substudy. It suggests rather clearly what sociologists have argued for some time: aspiration for (and therefore attendance at) college is intertwined with a multitude of other status-attainment processes. Thus substantial change in individuals' college-going behavior requires either substantial change in the association between higher education and social sorting processes or substantial interclass migration.

Table 8

Regression of Attendance on Composite Background Measures: NLS Students and NLS Applicants

	means		sd's		regression coefficients		correlation coefficients	
	All	Applicants	All	Applicants	All	Applicants	All	Applicants
Place	-.0043	.1304	.9636	.9957	.00907	.00863	.12300	.07465
Background	.0234	.2819	1.0003	1.0101	.03002	.03130	.34415	.20117
School	.0052	.2253	1.0024	.9864	.02546	.02028	.25747	.15749
Student	.0143	.5100	.9993	.8319	.01802	.06254	.38940	.30617
Friends	.0064	.3971	.9989	.8390	.04052	.04837	.43550	.22588
Occupation	.0001	.3573	1.0012	.8630	.03920	.03455	.45214	.24502
Aspiration	.0052	.4241	.9988	.7898	.04317	.04076	.33986	.30736
Plans	.0137	.5847	.9997	.7975	.15521	.21889	.69014	.42059
Attendance	.4596	.7716	.4984	.4199	—	—	—	—
Constant	—	—	—	—	.60814	-.45390		
R^2	—	—	—	—	.22021	.33110		

Table 9

Simplified Regression of Attendance on Background and Typical-Application Characteristics and Financial Aid

	1	2	3	Standardized 4
NEAST	-.04983	(-.03399)	(-.03139)	-.034
SOUTH	-.06103	(-.04825)	(-.04596)	-.048
NCENT	-.05815	(-.05078)	(-.05014)	-.052
BLMX	(-.00527)	(.00378)	(-.00268)	-.002
SESC	.04939	.05043	.05251	.086
PINCOME	(-.00015)	(-.00013)	(-.00009)	-.016
NOREL	-.08223	-.08330	-.08134	-.039
SPCOL	.00114	.00112	.00118	.054
SPFRM	-.00126	-.00119	-.00127	-.044
IMPAVG	.01056	.00989	.00919	.060
FRCOL	.08502	.08289	.08315	.082
OCCPLND	.00172	.00165	.00160	.068
OHOME	(-.13312)	(-.12863)	(-.13047)	-.028
OMIL	(-.06609)	(-.06523)	(-.05706)	-.016
EDASP	.02273	.02209	.02161	.083
PLACAD	.33844	.33757	.33727	.350
PLVTCH	.15419	.15494	.15967	.123
TCOSTM		(-.00085)	(-.00120)	-.029
CPRIVM		(-.04388)	(-.03893	-.030
CACTM		(.00659)	.00781	.056
CSMSTM		(.03990)	(.04030)	.040
TOTAIDM			(-.00529)	-.033
AIDM			.08463	.078
CONSTANT	.06338	-.08657	-.12767	
R^2	.22422	.22698	.23025	

Table 10A

Means on Selected Variables
for Students from Different Regions

	Original Subsample				Applicants			
	Northeast	North Central	South	West	Northeast	North Central	South	West
BLACK	.0502	.0439	.2060	.1001	.0441	.0596	.1774	.0829
SESC	2.0214	1.9823	1.9081	2.1701	2.1945	2.1460	2.1012	2.2574
PINCOME	131.5189	129.0548	117.2817	139.0503	146.3591	136.3498	131.4431	153.3856
NOREL	.0238	.0468	.0342	.1287	.0262	.0305	.0235	.1129
SPCOL	53.5873	46.9002	48.1131	55.2899	57.0771	49.2741	51.6024	57.9037
SPFRN	4.0139	13.2286	9.6303	9.3974	3.3556	12.7797	8.6780	7.8937
TEST	52.8716	51.7682	49.6238	51.1877	55.8338	54.3536	52.3823	53.4286
IMPAVG	5.7125	5.7417	5.8755	6.0234	6.4247	6.6417	6.6047	6.5879
FRCOL	.6211	.5625	.5704	.6149	.8138	.7710	.7519	.7775
OCCPLXD	58.6492	55.6259	58.1209	57.4665	65.2977	63.0936	64.4798	63.7857
OHOME	.0147	.0205	.0247	.0382	.0032	.0025	.0109	.0189
EDASP	3.8603	3.3998	3.9560	3.7912	4.7883	4.5121	4.7277	4.5089
PLACAD	.3121	.4346	.4711	.4711	.7965	.7120	.7525	.6854
CPRIVN					.2746	.0840	.1047	.0708
CACTN					22.0312	21.1460	20.2720	20.9413
CSHSTN					.6657	.7272	.6968	.7924
TCOSTN					18.9824	16.1496	13.0383	9.6658
TOTAIDN					1.0703	1.3012	.9878	.7642
AIDN					.2101	.2747	.2449	.2071
CATT	.4888	.4252	.4399	.5061	.8034	.7377	.7523	.7908
N	1203	1277	1201	694	660	540	558	398

Table 103

Descriptive Statistics for Students from Different Socioeconomic Backgrounds

	Original Subsample			Applicants		
	Low SES	Middle SES	High SES	Low SES	Middle SES	High SES
NEAST	.2490	.2849	.2812	.2649	.3190	.3078
SOUTH	.3569	.2393	.2636	.3373	.2407	.2457
NCENT	.2716	.3174	.2587	.2361	.2724	.2257
BLMX	.2660	.0568	.0159	.3285	.0593	.0147
PINCOME	64.9035	119.0166	212.3311	65.0254	118.1274	213.0938
NOREL	.0773	.0374	.0527	.0633	.0347	.0439
SPCOL	43.0785	49.8004	59.2265	45.6384	52.0036	60.5662
SPFRM	13.2695	9.1557	4.8086	12.3285	8.6388	4.8909
TEST	46.9593	51.3763	55.9911	49.8715	53.5761	57.1125
IMPAVG	5.2368	5.6714	6.7136	6.2280	6.3548	7.0113
FRCOL	.4077	.5678	.8210	.6362	.7625	.8782
OCCPLND	51.2568	56.2849	64.7302	60.5796	63.2187	67.2734
OHOME	.0265	.0238	.0171	.0114	.0028	.0136
EDASP	2.9474	3.6754	4.7498	3.9820	4.5695	5.0731
PLACAD	.2651	.4424	.7466	.5761	.7286	.8485
CPRIVM				.1052	.1156	.2083
CACTM				19.7506	20.8273	22.3256
CSMSTM				.7763	.7465	.6314
TCOSTM				13.0183	14.0193	17.4542
TOTAIDM				1.4637	1.0338	.8680
AIDM				.3860	.2327	.1622
CATT	.2533	.4274	.7400	.6355	.7474	.8740
N	1091	2227	1058	364	1061	730

Table 10C

Means on Selected Variables
for Students with Different Grades

	Original Subsample				Applicants			
	F-D	C	B	A	F-D	C	B	A
NEAST	.2751	.2800	.2926	.2248	.3320	.3039	.3299	.2571
SOUTH	.2785	.2691	.2778	.2791	.2697	.2579	.2539	.2624
NCENT	.2927	.3000	.2841	.2809	.1847	.2582	.2632	.2498
BLKX	.1514	.0961	.0862	.0636	.1367	.0995	.0857	.0511
SESC	1.8061	1.9640	2.0346	2.2447	2.0493	2.1438	2.1521	2.3158
PINCOME	116.6642	124.4119	132.1717	146.4146	137.9116	135.9988	142.1526	152.3392
MOREL	.0613	.0532	.0466	.0319	.0365	.0537	.0344	.0376
SPCOL	49.6815	51.1549	50.0675	49.7533	55.6196	53.2965	53.0947	51.3229
SPFRM	9.4928	7.9662	9.9727	10.5078	7.7673	6.5176	8.5914	10.0398
TEST	45.3107	49.8220	54.0770	58.9447	47.7258	51.8423	55.5985	59.8043
IMPAVG	1.7257	4.8262	7.6423	10.6317	1.7597	4.9752	7.6651	10.6544
FRCOL	.3972	.5370	.6778	.8274	.6687	.7439	.7990	.8822
OCCPLND	48.4775	53.8747	60.9736	67.8113	54.9324	61.0751	66.3545	70.1965
OHOME	.0246	.0213	.0259	.0193	.0078	.0067	.0075	.0110
EDASP	2.8534	3.4477	4.1520	4.9109	4.0119	4.3440	4.8128	5.2098
PLACAD	.2070	.4064	.5812	.8063	.4646	.6957	.7999	.8963
CPRIVN					.1187	.1241	.1485	.1980
CACTM					19.7664	20.6043	21.2998	22.7471
CSMSTM					.7602	.7111	.7014	.7077
TCOSTM					11.4578	13.5487	16.2287	17.8410
TOTAIDM					.3071	.7422	1.2436	1.6353
AIDM					.2100	.1858	.2489	.3211
CATT	.2068	.4027	.5329	.7848	.5833	.7448	.7866	.9009
N	793	1805	1184	592	227	824	686	418

Table 11A

Simplified Regression of Attendance on Background and Typical-Application Characteristics for Students from Different Regions

	NORTHEAST	NORTH CENTRAL	SOUTH	WEST
BLMX	-.01598	.10490	-.07656	.09059
SESC	.05563	.09619*	.02432	.05711
PINCOME	-.00014	-.00045	.00009	.00006
MOREL	-.12919	-.12586	.05229	-.06355
SPCOL	.00171*	.00173	.00040	-.00005
SPFRM	.00445*	-.00150	-.00472*	.00099
IMPAVG	.00817	.00922	.01554*	.00792
FRCOL	.07282	.02249	.12518*	.07659
OCCPLND	.00085	.00260*	.00101	.00196
OHOME	-.36756	-.08227	-.11899	-.09958
OMIL	-.16122	.51023*	-.01610	-.32904
EDASP	.02435*	.02421	.03189*	-.00031
PLACAD	.47442*	.42138*	.21754*	.30246*
PLVTCH	.18506*	.27939*	.07632	.22564*
CPRIVM	-.00712	-.04708	-.07580	-.02061*
CACTM	.00767	.00276	-.00026	.01289
CSMSTM	-.00205	.10404*	-.02905	.14623*
TCOSTM	-.00271	.00081	-.00068	.00046
TOTAIDM	-.00650	-.01378	.00442	-.00397
AIDM	.07959	.13681	.05859	.10185
CONSTANT	-.21237	-.33779	.16301	-.21508
R^2	.27692	.25949	.20173	.18172

Table 11B

Simplified Regression of Attendance on Background and Typical-Application Characteristics for Students with Different Grades

	F-D	C	B	A
NEAST	-.17491	-.01629	.04468	-.08102
SOUTH	-.20991	-.00334	.00333	-.10362*
NCENT	-.12833	-.02598	.00366	-.08893
BLNK	-.11080	.07645	-.05752	.03761
SESC	.06052	.09222*	.04554	-.00097
PINCOME	-.00046	-.00054	.00028	.00025
NOREL	.07868	-.08643	-.02517	-.14166
SPCOL	-.00003	.00248*	-.00021	.00104
SPFRM	.00097	-.00110	-.00213	-.00041
IMPAVG	.02955	-.00286	.04126	.01609
FRCOL	.01786	.11424*	.09520*	.04467
OCCPLND	-.00164	.00282*	.00084	.00271*
OHOME	-.16430	.17537	-.16058	-.04468
OMIL	-.05938	-.07335	-.02963	.21415
EDASP	.06900*	.01423	.03266*	-.01457
PLACAD	.29662*	.33215*	.32829*	.42503*
PLVTCH	.06346	.19453*	.15113*	.23368*
CPRIVM	-.12255	-.06389	.06889	-.07227
CACTM	.01950	.01089	-.00139	.01092
CSMSTM	-.04416	-.00821	.08484*	.09893*
TCOSTM	-.00574	-.00042	-.00276	.00158
TOTAIDM	-.00221	-.00729	-.01108	.00082
AIDM	.18120	.08390	.13504*	.05332
CONSTANT	-.03879	-.27787	-.23013	-.18032
R^2	.08371	.22479	.17532	.21256

Table 11C

Simplified Regression of Attendance on Background and Typical-Application Characteristics for Students from Different Socioeconomic Backgrounds

	Low SES	Middle SES	High SES
NEAST	-.08535	-.05041	-.00714
SOUTH	-.08297	-.06455	-.00375
NCENT	-.10721	-.04636	-.03856
BLMX	-.06855	.05078	.09577
PINCOME	-.00513	-.00008	-.00003
NOREL	-.06192	-.10610	-.03751
SPCOL	.00166	.00186*	.00004
SPFRM	-.00305*	-.00069	-.00140
IMPAVG	.01777	.00757	.00963
FRCOL	.11418	.05148	.10946*
OCCPLND	.00115	.00158*	.00118
OHOME	.20723	-.28455	-.21573
OMIL	-.22621	-.02974	-.07006
EDASP	.05285*	.00853	.01633
PLACAD	.31073*	.41803*	.19845*
PLVTCH	.21431*	.17507*	.08450
CPRIVM	-.04279	-.09911	-.00147
CACTM	.01188	.00639	.00604
CSMSTM	.06304	.07624*	-.01984
TCOSTM	-.00237	.00108	-.00204
TOTAIDM	-.00305	-.00445	-.00346
AIDM	.15372*	.06837	.02911
CONSTANT	-.19105	-.04656	.31223
R^2	.28683	.20881	.08926

Financial aid, despite its significant impact, is not likely to accomplish either of these, and therefore its effects are limited.

POST-ADMISSION SELECTION

Under half the 2,882 applicants applied to more than one college. For this final analysis we examined the choices of the students receiving two or more offers of admission. We constructed a file containing for each of the 1,681 suitable applications (missing data and rejected applications reduced the sample) college characteristics, aid offers, and the average characteristics of the other colleges the student considered. We then estimated an equation relating these variables (summarized in Table 12) to the student's choice. This equation appears in the last columns of Table 13.

These equations are a bit cryptic and therefore merit some explication. The general model underlying this choice analysis is that the probability a given student will select a given college from those which accepted him or her varies positively with that college's attractiveness and negatively with the attractiveness of the other options in the student's choice set. One way to specify this is to assess the difference between a college and its competitors and analyze this variable; we instead include two variables in the equation for each attribute of interest. The first, labeled "Own," is the attribute of the college in question (recall this analysis describes applications rather than students). The second, labeled "Other," is our summary of the characteristics of the other colleges in the student's choice set. Ideally the coefficients of these variable pairs should be of equal magnitude but take different signs; that they do not in Table 13 reflects imperfections in the construction of the Other variables. Using the variable pairs instead of a simple difference helps restrict this problem to the Other variables.

Two effects dominate the equations. First, from the sixth column of Table 13, colleges awarding aid are 30 percentage points more likely to be chosen than those not doing so, all other measured characteristics equal. Second, two-year colleges are 25 percentage points more likely to be chosen than four-year colleges. In practice, of course, these

Table 12

Characteristics of Collegiate Applications Filed by NLS Respondents Accepted by at least Two Colleges and Attending College

	own applications		other applications		own/other correlation
	m	sd	m	sd	
Total Cost	16.7305	12.5739	16.8410	11.1280	.149
Total Aid	2.2442	6.1566	1.4859	4.7636	.111
Some Aid	.2156	.4114	.2130	.3827	.305
Distance	3.7559	6.3656	3.8166	5.8657	.294
Public	.6501	.4771	.6503	.4245	.322
ACT	22.1548	3.2551	22.2210	3.0441	.556
Enrollment	8.6900	8.3639	8.7728	7.4958	.317
Less than BA	.1598	.3666	.1529	.3339	.200
Chosen	.4195	.4936	—	—	

Table 13

Regression of Choice on Applications' and Other Apolications' Characteristics

	zero-order correlation with choice		equation with single characteristic		multiple	overall equation	
	own	other	own	other	r	own	other
Total Cost	-.005	-.014	-.00011	-.00058	.014	(-.00244)	(-.00032)
Total Aid	.176	-.176	.01589	-.02047	.264	(.00428)	-.00738
Some Aid	.229	-.176	.37400	-.34996	.343	.29717	-.27161
Distance	-.039	.028	-.00400	(.00365)	.057	-.00415	(.00364)
Public	-.063	.041	-.08846	.07968	.091	(-.08105)	(.05381)
ACT	-.058	.053	-.01933	.02015	.119	(-.00277)	.01103
Enrollment	-.123	.046	-.00903	.00624	.132	(-.00362)	.00182
Less than BA	.169	-.119	.26997	-.23500	.230	.24255	-.19671
Constant						.30326	
R^2						.178	

effects are much smaller, since students receiving aid from one college are likely to do so from others and students admitted by one two-year college are likely to have applied to and been admitted by others. Even so, however, the financial aid findings suggest such awards are a powerful tool colleges might use to compete with each other. The results for two-year colleges reinforce the historical trend toward enrollment in such schools.

FINANCIAL AID AND TITLE III

The final section of our technical report for this subtask assesses the implications of these and other, more detailed findings for large-scale student aid programs. We conclude there that such programs are not a very efficient way to influence demand for higher education; unfortunately, few others have received much attention so comparisons are hard to make. Our question here is narrower, however. How much impact might the expansion of federal student aid programs have had on enrollment at Title III colleges? In the introductory part of this appendix we provided a range of answers: these programs probably increased the enrollment rate among all high school graduates by 0.3 to 2.0 percentage points, and most likely by about one percentage point. Even so, the overall enrollment rate among high school graduates dropped.

This result depended on our results for college attendance per se, however; might Title III colleges have had some competitive edge? We showed in the last analysis above that the competitive effects of student aid were far larger than its overall demand-increasing ones; thus if applicants to Title III colleges (1) applied to and were admitted to several schools and (2) received larger aid offers from the Title III schools we could argue a larger allowance should be made for aid effects. Neither of these points finds much support; surveys of the freshman class of 1972 show those in predominantly Black and other colleges apply to and are accepted by about the same number of colleges. Nor is it likely predominantly Black colleges had the resources to provide extensive student aid beyond that their competitors could offer. Thus we arrive at our conclusion that the only effect of student-directed federal

financial aid on Black colleges was their share of its modest but general effect on students' inclination toward college.

To summarize, then: students choose to go to college based on a wide range of influences, predominantly their socioeconomic background, their academic achievement, and their aspiration. The effect of these influences is such that there is little room for college characteristics or actions to counteract them, and therefore it is not surprising that we find few effects of college characteristics. Student aid, on the other hand, does have an impact on students' decisions whether to attend: aided applicants are some 8.5 percentage points more likely to attend than their otherwise identical but unaided counterparts. These effects are somewhat larger for low-SES students, those with poor grades, or those from North Central states; moreover, the effect of aid on which of several offers of admission a student favors is substantially larger. From these figures we conclude that (1) only a small increase in the college-going rate—0.3 to 2 percentage points, depending on the assumptions made—can be attributed to expanded federal student aid programs between 1969 and 1972, (2) student financial aid may not be the most efficient way to increase demand for higher education, and (3) if Title III colleges in fact increased their enrollment over these years (after adjusting for expansion of the eligible population) then those effects probably are not due to student aid and therefore may be due to the Title III program itself.

Projections are considerably more difficult. If the Title III program enabled colleges to offer substantially more aid than their competitors, then our results suggest the result would be sharply increased enrollment among multiple applicants. If it instead enabled them to change their characteristics, then our results are not directly applicable, but we suspect a lesser effect would obtain.

FOOTNOTES

1. A Fact Book on Higher Education, Tables 74.8 and 74.117.

2. Digest of Educational Statistics, 1975, Table 146.

3. Digest of Educational Statistics, 1975, Table 142.

4. American Council on Education, The American College Freshman: National Norms, editions for Fall 1969 and Fall 1972.

5. A Fact Book on Higher Education, Table 74.7.

6. Gregory Jackson and George Weathersby, "Individual Demand for Higher Education," Journal of Higher Education, Vol. 46 (1975), pp. 623-52.

7. Ibid.

8. Sandra Willett, "Information in Federal Student Assistance," unpublished manuscript, Kennedy School of Government, Harvard University, 1976.

9. Christopher Jencks and Marsha Brown, "Effects of High Schools on Their Students," Harvard Educational Review 45(1975), pp. 273-324.

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